

**Summary of Changes to
KENTUCKY MINIMUM SPECIFICATIONS FOR SCHOOL BUSES
2008 EDITION**

1. Page 11, SERVICE MANUALS, Add:

Body and/or chassis suppliers, including integral suppliers, shall provide each school district purchasing school buses with one complete set of the most current service manuals available, including body, chassis, engine, wiring locator, and body parts manuals at no additional cost. Body and/or chassis suppliers shall also supply one copy of the first level diagnostic software for the engine, brakes and transmission at no additional cost. Providers of integral units shall provide chassis parts manuals in addition to the above at no additional cost. Manuals and software shall be shipped on the basis of one complete set per school district, with the bus invoice, prior to delivery of the completed school bus.

Reason for the change: With the increased use of computer controls of all the buses sub-systems a mechanic must have access to software to read fault codes and make necessary repairs.

2. Page 14, Axle (rear), Change:

NOTE: IN REGARD TO THE REAR AXLE RATIO DESIGN PARAMETER, REAR AXLE RATIO SHALL BE DETERMINED FOR EACH ENGINE POWER COMBINATION TO PROVIDE FOR MAXIMUM EFFICIENCY IN A PICKUP DELIVERY DUTY CYCLE 0 TO 35 MILES PER HOUR ATTAINABLE ROAD SPEED AT A MINIMUM OF 65[55] MILES PER HOUR WITHIN RECOMMENDED RPM RANGE.

Reason for the change: To bring the specification in line with current regulations concerning road speed.

3. Page 16, STRAIGHT AIR BRAKES, Change:

School bus chassis of thirty-four (34) passenger capacity and larger shall be equipped with "s-cam type" straight air braking systems. All air brake equipped chassis shall be equipped with Bendix 4-Channel ABS, Wabco 4-Channel ABS, Wabco 6-Channel or prior approved equal.

Reason for the change: The additional channels allow for more uniform modulation.

4. Page 16, STRAIGHT AIR BRAKES, Change:

The antilock braking system shall be a full vehicle, wheel control, 4-channel system. The antilock system shall contain an in-dash diagnostic capability. The ABS computer shall be part of the relay valve and frame rail mounted in a serviceable location or as a separate unit under the dash in a serviceable location. Manufacturers shall warrant this system for five (5) years.

Reason for change: The location of the ABS computer under the dash provides a clean protected location for the system controller.

5. Page 17, AIR COMPRESSOR, Add:

The air compressor shall be a minimum 13.2 cubic foot capacity. The air compressor shall be Bendix Corporation Tu-Flo 550, Wabco NW-250 15.2 cubic foot capacity or prior approved equal.

Reason for the change: The Wabco NW-250 provides higher capacity and is standard equipment on the Caterpillar and Detroit/Mercedes engines.

6. Page 18, SLACK ADJUSTERS (AUTOMATIC), Change:

Automatic slack adjusters shall be installed as original equipment on all air brake systems and have worm adjustment screws for continuous adjustment with external grease fittings. Automatic slack adjusters shall be Haldex 400-10-001~~[409-10-2244]~~ or prior approved equal. Grease fitting shall be indexed for serviceability.

Reason for the change: The Company has changed part number.

7. Page 18, BUMPER (FRONT-TYPE "C"), Change:

The front bumper shall be constructed of steel, a minimum three sixteenths (3/16) inch ~~[of one fourth (1/4) inch]~~ thick, one piece construction, a minimum of eight (8) inches in width, ends extending to outer edge of the fender and closed. The bumper shall be designed and formed to equate in strength in frontal and quarter loading to a strength that would allow it to support the weight of the vehicle during jacking at selected jacking points.

Reason for change: The one fourth inch thick bumper is no longer available. Additional language has been added to preserve the integrity of the bumper by requiring forming to increase strength.

8. Page 19, CLUTCH, Delete:

~~[CLUTCH][The clutch shall be a minimum fourteen (14) inch single plate, ceramic disk. A clutch depressed start switch or neutral start safety switch shall be installed.]~~

Reason for the change: Manual shift buses are no longer available.

9. Page 19, COOLING SYSTEM, Add:

A coolant recovery system shall be provided. All coolant overflows, if applicable, shall be run outside of the engine compartment and extend below the frame rail. The coolant system shall be monitored by an audible and visual signal for over-temperature conditions and shall be located in the driver compartment (refer to "Engine" section). Coolant shall be extended life coolant TELC ASTM 4985 or fully formulated, ethylene glycol, long life diesel coolant ASTM D-5345 and ASTM D-6210.

Reason for the change: Long life ethylene glycol has most of the advantages of organic acid anti-freeze and does not harm gaskets and hoses.

10. Page 20, ELECTRICAL SYSTEM. ALTERNATOR, Change:

The electric power source shall be: a heavy-duty, bus-type alternator; a minimum of one hundred eighty-five [~~forty-five (145)~~] ampere minimum output at seven thousand five hundred (7,500) RPM rotor speed and a minimum of seventy-four (74) ampere output at normal recommended engine idle speed; driven by a serpentine belt; designed and sized not to exceed the alternator bearing speed. The rotor shall be of a diameter that would not be destructive to belts being used. The alternator shall be pad mounted [~~with mounting span SAE J-180~~] on the topside of the engine with the regulator indexed for easy service. The regulator shall be preset to fourteen (14) volts. It shall not have a cold, continuous draw in excess of ten (10) mill amperes and shall be self-energized with a cut in speed less than low engine idle speed. The alternator shall be Leece-Neville 4839 PAH [~~2805 LC~~] or prior approved equal.

Reason for the Change: The new model buses have increased electrical power requirements. The larger alternator puts out more power at engine idle when power consumption is greatest. Pad mounting is standard on these high output alternators.

11. Page 20, BATTERY, Add:

All chassis shall require installation of three (3) [~~two (2)~~] low maintenance or maintenance-free "Group 31" batteries. The batteries shall be designed for heavy-duty deep cycling bus operation, constructed of thermal-rigid hard rubber or heavy plastic case and designed to resist damage from road shock and heat distortion. The battery shall be a minimum B.C.I group, size 31, twelve (12) volts, one hundred [~~and~~] eighty (180) ampere-hour capacity, cold-cranking current six hundred [~~and~~] twenty-five (625) amps with top post terminals.

Reason for the change: Buses have three computers that must draw continuous power. If a bus is parked for a long time this load will drain the batteries. Engines are also equipped with manifold pre-heating grids that draw power on start up. In order to ensure adequate power an extra battery is necessary.

12. Page 21, WIRING HARNESS, Add:

All conductors from the alternator to the battery shall be continuous in length and uninterrupted by fusible links or shunts. The conductors shall be sized to provide at least a twenty-five percent (25%) greater current-carrying capacity than the design output of the alternator (minimum four-gauge wire).

The conductor between the alternator and the battery shall be routed in a manner that will provide the least distance between points of termination. A separate ground conductor from the alternator to the engine shall be provided (minimum four-gauge wire). There may be a 200amp mega-fuse installed between the alternator and the batteries to avoid electrical spiking provided this fuse is clearly visible, identified and serviceable.

Reason for the change: Some engine computers are not internally protected from electrical spiking. These engine manufactures recommend a “master” fuse to protect these systems.

13. Page 22, Engine, Add:

The chassis shall be equipped with one of the following diesel engines:

Engine	Horsepower	Chassis
INTERNATIONAL MAXFORCE DT466	190	34-52 PASSENGER TYPE "C"
INTERNATIONAL MAXFORCE 7	175	34-52 PASSENGER TYPE "C" “
INTERNATIONAL MAXFORCE DT466	215	66-72 PASSENGER TYPE "C"
INTERNATIONAL MAXFORCE 7	200	66 PASSENGER TYPE “C”
INTERNATIONAL MAXFORCE DT466	215	66-78 PASSENGER "FC"
INTERNATIONAL MAXFORCE DT466	230	72-84 PASSENGER "RE"
INTERNATIONAL MAXFORCE DT466	250	78-84 PASSENGER "RE"
CATERPILLAR C7	190	34-52 PASSENGER TYPE "C"
CATERPILLAR C7	210	66-72 PASSENGER TYPE "C"
CATERPILLAR C7	210	66-78 PASSENGER "FE"
CATERPILLAR C7	230	72-84 PASSENGER "RE"
CATERPILLAR C7	250	72-84 PASSENGER “RE”
<u>MERCEDES MBE 900</u>	<u>190</u>	<u>34-52 PASSENGER TYPE “C”</u>
<u>MERCEDES MBE 900</u>	<u>210</u>	<u>66-72 PASSENGER TYPE “C”</u>
<u>MERCEDES MBE 900</u>	<u>210</u>	<u>66-78 PASSENGER “FE”</u>
<u>MERCEDES MBE 900</u>	<u>230</u>	<u>72-84 PASSENGER “RE”</u>
<u>MERCEDES MBE 900</u>	<u>250</u>	<u>72-84PASSENGER “RE”</u>

Reason for change: The Mercedes MBE 900 engine is standard for one vendor and fully supported by Detroit diesel dealers as well as the Caterpillar dealer.

14. Page 23, Engine

1. The manufacturer's standard deaeration tank and coolant recovery system with the overflow escape hose, if applicable, exiting the engine compartment below the frame rail.
2. Horton on/off Fan Clutch (electro-magnetic, or air). The eight cylinder engine shall utilize a Horton direct sensing viscous fan.
3. An engine heater with a minimum of seven hundred [~~and~~] fifty (750) watts, one hundred [~~and~~] ten (110) line voltage, with prior approved wire connection and location by the Department of Education, Pupil Transportation Branch. The heater receptacle shall be dust and water sealed and permanently located in a recessed area of the bumper, or prior approved location.
4. The oil filter shall be a minimum two (2) quart capacity (1.79 quart net capacity).
5. A primary fuel filter and water separator located between the tank and engine transfer pump. The filter shall be OEM installed and approved.
6. Filter shall be Racor Model 330[;] thirty (30) micron spin-on, Racor Model 490[;] thirty (30) micron spin on or prior approved equal. The Pupil Transportation Branch at the pilot inspection shall approve the location.
7. If the fuel system includes a fuel return line to the tank, a secondary fuel filtration, in addition to the Racor Model 330 thirty (30) micron, shall be the manufacturer's standard for engine protection.
8. Fuel system check valve shall be installed on the engine side of the fuel line exiting the fuel filter.
9. The engine shall be equipped with an electronic hand throttle. The throttle shall have no reference to cruise control and shall be marked "Throttle – High/Low". The hand throttle shall automatically return to idle when the service brake is depressed.
10. Corrosion-resistant metal hose bibs (sized for one inch ID heater hose), accessible to the body company for heater installation, shall be installed. Hose bibs, necessary plumbing, and indexing of plumbing shall require prior approval.
11. All engine coolant hoses, requiring clamp connection one (1) inch and larger on the engine or associated components, shall be equipped with a Breeze constant torque clamp, Mubea Constant Tension clamp or approved equal.

15. Page 24, EXHAUST SYSTEM, Change:

A total exhaust system, exhaust pipe, muffler and tailpipe shall be furnished by the chassis manufacturer, all routing to or through the bumper shall be manufactures standard for rear exhaust evacuation. The system shall be warranted for five years. If a manual regeneration mode is included in the system the control for the start of this system shall be designed or located to be accessible to a technician but not the driver.~~[shall be pre-engineered to terminate flush or not more than one (1) inch past a school bus body rear bumper location, and shall not be positioned more than three (3) inches downward from the rear bumper. Manufacturer drawing shall be provided to the Department of Education, Pupil Transportation Branch, and the respective body companies, showing exhaust system routing and support bracket locations.]~~

~~[The chassis manufacturer shall provide sufficient tail pipe length to allow mounting by the body company without extension.]~~

Reason for the change: New exhaust systems are designed to lower harmful emissions. As a result they produce higher exhaust temperatures. They rely on standard routing as part of the method of compliance with EPA regulations and cannot be changed by the end user.

16. Page 25, FRAME LENGTHS, Change:

The length of the chassis frame and other chassis dimensions shall not be less than the minimum in the following table:

CHASSIS PASSENGER CAPACITY	WHEEL BASE LENGTH (Inches)	COWL TO CENTER LINE OF REAR AXLE (Inches)	COWL TO END OF FRAME (Inches)	CENTER LINE OF REAR AXLE TO END OF FRAME (Inches)	MAXIMUM EXTENSION ALLOWED (Inches)
34	167 – 170	145	251		
52	215 – 218	192	295		
66	273 – 279 [276]	250	368		
72 C	273 – 279 [276]	250	419		
66 FC	193 (MIN)				
70-78 FC	228 (MIN)			138	22
72-84 RE	(MANUFACTURER'S STANDARD)				

Reason for the change: Allowing the additional three inches gives an additional vendor the opportunity to bid.

17. Page 30, TIRES AND RIMS, Add:

Tires supplied on all Kentucky school bus chassis shall be first-line, steel belted, low profile and tubeless with highway-type tread, supplied by one of the major tire manufacturers under its own brand name and furnished as original equipment as shown in the chassis supplier's most recent data book and specifications literature on file with the Pupil Transportation Branch. The tires shall be of the same manufacture and tread design wheels. The tires shall be Goodyear 295/75R22.5 G169, General 295/75R22.5, Michelin 275/80R22.5 XZE, Bridgestone/Firestone 295/75R22.5 or prior approved equal.

Reason for change: These two tires are projected to wear better than what we are getting by more than fifty percent.

18. Page 31, TRANSMISSION (AUTOMATIC), Add:

Buses equipped with 3000 PTS transmissions may utilize a touch pad shifting mechanism. All 2500 series transmissions shall be equipped with an Allison approved cable controlled scabbard shift.

The following engines shall be equipped with the following automatic transmissions:

Engine	Horsepower	Capacity	Transmission	Standard/Option
INTERNATIONAL DT466E	190	34-52	PTS2500	STANDARD
INTERNATIONAL DT466E	215	66	PTS2500	STANDARD
INTERNATIONAL DT466E	215	66	PTS3000	OPTION
INTERNATIONAL DT466E	215	72-C	PTS3000	STANDARD
INTERNATIONAL DT466E	215	66-78 FC	PTS3000	STANDARD
INTERNATIONAL DT466E	230-250	72-84 RE	PTS3000	STANDARD
CAT – C-7	190	34-52	PTS2500	STANDARD
CAT – C-7	210	66	PTS2500	STANDARD
CAT – C-7	210	66	PTS3000	OPTION
CAT – C-7	210	72-C	PTS3000	STANDARD
CAT – C-7	210	66-78 FC	PTS3000	STANDARD
CAT – C-7	230-250	72-84 RE	PTS3000	STANDARD
<u>MERCEDES MBE 900</u>	<u>190</u>	<u>34-52</u>	<u>PTS2500</u>	<u>STANDARD</u>
<u>MERCEDES MBE 900</u>	<u>210</u>	<u>66</u>	<u>PTS2500</u>	<u>STANDARD</u>

Engine	Horsepower	Capacity	Transmission	Standard/Option
<u>MERCEDES MBE 900</u>	<u>230</u>	<u>66</u>	<u>PTS3000</u>	<u>OPTION</u>
<u>MERCEDES MBE 900</u>	<u>230</u>	<u>72-C</u>	<u>PTS3000</u>	<u>STANDARD</u>
<u>MERCEDES MBE 900</u>	<u>230</u>	<u>66-78 FC</u>	<u>PTS3000</u>	<u>STANDARD</u>
<u>MERCEDES MBE 900</u>	<u>230-250</u>	<u>72-84 RE</u>	<u>PTS3000</u>	<u>STANDARD</u>

Transmissions shall be equipped with an automatic backup light switch. The chassis manufacturer shall be responsible for matching the transmission ratios, with respective engines within design parameters of the school bus operation.

Reason for the change: This allows an additional vendor to participate in the bid process on an equal footing.

19. Page 33, ANTIFREEZE, Add:

The bus body company shall replenish the cooling system and fill the body heater system with extended life coolant TELC ASTM 4785 or fully formulated, ethylene glycol, long life diesel coolant ASTM D5345 and D-6210. Antifreeze type and additives shall meet the requirements of the respective engine manufacturers and radiator suppliers. The additive levels, when required, shall be recorded by the company performing the pre-delivery service. Prior evidence that antifreeze meets the respective manufacturer's recommendation must be furnished.

Reason for the change: The antifreeze added by the body company must be compatible with the engine manufactures specifications.

20. Page 34, BATTERY, Change:

All[Both] batteries shall be installed in a battery box or sliding tray with a door.~~in accordance with the current SBMTC Design Objectives]~~ A battery hold down bracket shall be designed for clamping action around all four sides of the battery. All chassis will be equipped with three (3)~~two (2)]~~ batteries. The battery box shall be labeled with one-inch (1") letters. The bracket shall be designed for three (3)~~two (2)]~~ "Group 31" batteries and secured to the sliding tray with a minimum of two (2) tie-down bolts. Battery conductors entering the battery compartment shall be securely clamped to eliminate cable abrasion. (Brackets not allowing forward or lateral movement of the battery tray will not be acceptable.) Type "D" chassis manufacturers shall provide for the battery location, meeting the above mentioned performance requirements and shall coordinate with the

respective body manufacturer and the Department of Education, Pupil Transportation Branch, for approval of location.

Reason for the change: New buses have three computers that create a constant power load. This small load is a strain on a two battery system that can lead to a no start condition. The extra battery helps guard against this problem.

21. Page 36, CEILING, Add:

The interior of the bus body shall be free of all unnecessary projections likely to cause injury. This standard requires an inner lining on the ceiling and walls. Ceiling panels may be perforated.

Reason for the change: Perforated ceiling panels are standard equipment on certain bus models. They are used to help deaden sound. They are not required on all bus types but this change allows the vendor to use this option to help manage noise when necessary.

22. Page 36, COLOR, Change:

The outside of the school bus body, excluding those components painted by the chassis manufacturer, shall be painted with lead-free primer and polyurethane surface coat. The surface coat shall be "National School Bus Chrome (yellow) " in accordance with the colorimetric specifications of Federal Standard 595A, Color 13432. The roof of the school bus shall be painted with lead-free primer and white polyurethane surface coat. White paint shall extend to within six (6) inches above the drip rails on the side of the body except that the front and rear roof caps shall remain National School Bus Yellow. The interior of the school bus body shall be painted the manufactures standard

color(white, off white, light gray)[light blue, BASF #E29BM001], with a lead-free primer and surface coat.

Reason for the change: New assembly techniques make a specified interior color prohibitively expensive. Standard offerings have changed and are acceptable.

23. Page 38, ROOF CONSTRUCTION, Add:

Mechanical fasteners shall be used in all roof panel joints to achieve sixty (60) percent joint strength. Construction adhesive will not be permitted to meet the joint strength requirements. All roof sheets shall be sealed with Ruvan or approved equal. The product supplier shall certify that recommended practice is being followed. Manufactures utilizing structural adhesives along with mechanical fasteners (hybrid joints) to achieve compliance with FMVSS 221 shall be capable of demonstrating to the Kentucky Department of Education that the design of the hybrid joint in conjunction with the adhesive and mechanical fasteners used is capable of 150% of FMVSS 221 strength test.

Reason for change: Industry is moving toward the use of hybrid joints. These joints can be made stronger than the current mechanical fastener joint. This standard ensures that this type of joint is fifty percent stronger than the Federal requirement.

24. Page 40, PROTECTION, Change:

An air pressure valve shall be required for the protection of the air brake system in which air shall be drawn from the supply tank, in accordance with FMVSS 121 and shall be located as per the requirements of the respective chassis body builder's manual. The body company shall supply an air pressure regulator for air supply to the slave cylinder that will ensure the regulated air supply not to exceed the designated regulator setting. The body company shall supply a means to control the door closure and opening speed. The force required to achieve the door closure shall be a maximum of sixty-five (65)~~forty-five (45)~~ pounds prior to and through the door achieving the closing plane. The door closure force shall be so constructed to minimize the occurrence of injury to persons caught in the area while in a door closing mode. The door shall be so designed to provide for manual opening in the absence of air pressure or electrical current for energizing without further action by the driver, such as manually off-loading the cylinder or de-meshing the gears.

Reason for change: This standard was written for a bi-fold door. All new entrance doors are outward opening. An outward opening door requires sixty-five pounds to stay closed when traveling at highway speed.

25. Page 42, EMERGENCY DOOR LATCH, Add:

The latch handle shall be protected by a steel shield of adequate width to prevent the handle from being actuated by a child falling against the emergency door. This guard shield shall have sufficient clearance above the latch handle to permit easy grasp of the handle. If the handle is not easy to grasp, a door pull shall be installed that will allow the full hand to be used for pulling the door closed.

Reason for the change: Drivers must open this door every day. The driver needs an easy way to accomplish this required task.

26. Page 48, FOUR WAY FLASHER SWITCH, Add:

A separate four-way flasher switch shall be located adjacent to the noise suppression switch to allow a driver to activate/de-activate both switches simultaneously or individually. The switch shall be labeled "Four-way Flasher".

Reason for the change: The new railroad crossing procedure requires the driver to engage his four way flashers at all grade crossings. The standard position for this switch is on the

steering column and very difficult to access. Moving it to a more accessible location keeps the driver better able to control the vehicle during this critical maneuver.

27. Page 50, FIRST-AID KIT LOCATION, NOTE, Add:

NOTE: FIRST-AID KIT COMPONENTS SHALL BE PACKAGED IN A METAL DUST-PROOF CONTAINER. THE KIT SHALL BE EDCOR SAFETY MODEL 24M-SBK-91, CERTIFIED SAFETY MANUFACTURING MODEL 24M-SBK-94 OR PRIOR APPROVED EQUAL.

Reason for the change: All the contents of these kits are interchangeable. Allowing both encourages competition.

28. Page 56, COMBINATION STOP TAIL LAMPS, Add:

The bus shall be equipped with two (2) combination stop and tail lamps, a diameter of not less than seven inches (7"), with plain red lens emitting red light plainly visible from a distance of five hundred (500) feet to the rear. These lamps shall be as high as practicable but below the window line and spaced as far apart as practicable, no less than three (3) feet. Measurements shall be taken from the lamp centers. The stoplights are to be activated by the brake switch. These lamps are to be Weldon 10-10-1120, Catseye 650ST, or approved equal. If these lamps are not round they must have a minimum thirty eight (38) square inch surface area.

Reason for the change: Allows rectangular lights provided they have similar illumination to round lights.

29. Page 58, EIGHT-LIGHT WARNING SYSTEM , Add:

All systems shall include a separately fused manual over system. Flashing lamps shall be Bader Brown 2100 Series, Red 2700-140-000, Amber 2700-150-000, Weldon 1080-1106-10 (red) – 20 (amber), Weldon 2100 or prior approved equal. The flasher device shall be Weldon 7000 with a flash rate of seventy (70) to seventy-five (75) c/p/m or prior approved equal. If a system controller is utilized it shall be warranted for five (5) years. All eight way light lenses shall be easily replaceable using mechanical fasteners.

Reason for the change: Allows the use of rectangular lights provided they can be easily replaced and do not cause extra expense for local districts.

30. Page 58, OPERATION OF WARNING LIGHT-STOP SYSTEM, Add:

The location of the momentary switch is subject to the approval of the Pupil Transportation Branch. The momentary switch shall be Cole Hersee 9238, or Eaton 53-5262 for manual operation, a yellow momentary rocker switch or approved equal. The momentary switch and its operation shall be identified by decal or lettering and should function as follows:

Reason for the change: The Eaton 53-5362 switch is equal to the Cole Hersee 9238.

31. Page 61, CROSSING CONTROL ARMS, Add:

12. All crossing gate system components shall be warranted for two years, parts and labor.

Reason for the change: There has been a higher than acceptable failure rate on this component. The vendor claims that the newest improvements to their product will address this issue. An additional year warranty is an act of good faith on the companies part.

32. Page 62, STATIONARY REFLECTORS, Add:

The school bus body shall be equipped with at least six (6) stationary reflectors. Two (2) red reflectors shall be located on the rear of the bus body; one (1) amber reflector shall be located on each side of the body near the rear. Other reflectors required by the FMVSS shall be of the same quality as the reflectors required for the other locations. These reflectors shall be Grote 40152, or an approved equal. Body companies may use 3M or Reflexite film to meet FMVSS instead of the standard reflector.

Reason for the change: The standard plastic FMVSS 108 reflector has a tendency to fade and crack over time. The films do not. This change should lower maintenance costs.

33. Page 67, SEATS (PUPIL), Change:

All pupil seats shall meet the same padding requirement and be made of the same material. Pupil seats shall be padded and covered with flame retardant materials. The covering for cushions and backs shall be heavy grade, high quality, and coated fabric material, and a minimum of thirty-five (35) ounces per square yard finished weight. Vinyl and backing material must meet a minimum of ten (10) pounds of adhesion, when tested per ASTM D-751-79. A sample of the material to be used shall be tested for adhesion just prior to the construction of the buses. All seat frames shall be FMVSS 210 compliant and installed per FMVSS 210 for vehicle of GVWR 10,000 or less. (Seat belt ready seats)

Reason for the change: Clarifies the finished weight as per square yard as opposed to bolt width as is common in the fabric industry. Requires body companies to do standard quality testing on the material to ensure that the vinyl will not peel off the backing.

34. Page 72, [TAILPIPE]

~~[The tailpipe shall extend flush with or not more than one (1) inch beyond the edge of the rear bumper.]~~

~~[NOTE: TAILPIPE INSTALLATION, HANGER LOCATION AND METHOD (NO WELDING TO FRAME RAIL) SHALL BE JOINTLY PRE-ENGINEERED BY~~

~~THE CHASSIS AND BODY MANUFACTURER WITH APPROVAL REQUIRED BY THE PUPIL TRANSPORTATION BRANCH BEFORE THE CONTRACT AWARD.]~~

~~[NOTE: TYPE "D" RE TAIL PIPES SHALL EXIT TO THE LEFT SIDE, NOT MORE THAN THREE (3) FEET FROM THE REAR OF THE BUS OR EXIT TO THE RIGHT REAR OF THE BUS.]~~

Reason for the change: This section is no longer necessary because of the changes made to exhaust system section on page 24.

35. Page 73, WINDOWS, Add:

Standard seat side windows shall be the aluminum split-sash type with an unobstructed emergency opening a minimum of nine (9) by twenty-two (22) inches. Window glass shall be installed with welting or rubber gasket material around the perimeter of the glass inside the frame.

Reason for the change: This requires that glass be easily replaceable.

36. Page 74, PUSH OUT WINDOWS, Add:

Type "A", "C", and "D" school buses shall be equipped with push-out windows. The windows shall meet the requirements of FMVSS 217. The windows may be horizontally or vertically hinged provided the same type is used for the entire order. They shall require a maximum clear area available, as referenced to the position of the seat backs (refer to "SEATS (PUPIL)"). The windows shall be identified for emergency egress with decals on the inside and outside. Decals shall be of the same manufacturer and type as used on the emergency door (refer to "EMERGENCY DOOR"). Decals may be placed on the lower glass area near the release handle subject to the approval of the Pupil Transportation Branch. Decals shall be applied on the outside of the glass so the student cannot peel the decal off. (Requires reverse print decal).

Reason for the change: Vertically hinged emergency exit windows are standard with some body companies and may provide a clearer egress than horizontally hinged windows.

37. Page 77, ENGINE (type "A") Change:

Engines for Type "A" school buses shall be a 6.6[6.5] or 6.0[7.3]liter diesel engine.

Reason for change: Engine manufactures have changed the displacements when the engines were redesigned to meet clean air standards.

38. Page 87, ELECTRO-HYDRAULIC LIFT, Add

Type "C" thirty-four (34) through sixty-six (66) passenger and type "A" twenty-two (22) passenger school buses may be equipped with an electro-hydraulic lift.

Thirty-four (34) through sixty-six (66) passenger body shells shall be equipped with a Braun Millennium series hydraulic lift Model L917IB with padding kit or Ricon S series

S5510 with padding kit.

The above-mentioned lifts shall be rated at a minimum eight hundred (800) pounds working capacity, be equipped with a pressure relief switch for ground contact, and have automatic positioning at the floor level.

The successful bidder (Braun or Ricon) shall provide factory support on an as need basis and up to five training classes for technicians during the contract period.

The controls pennant shall be mounted and accessible to the operator from the outside of the bus. It shall be protected by a re-settable circuit breaker within the lift manufacturer's specifications. The outside vertical post shall be padded to below barrier height. The platform shall be thirty-inches wide at a minimum, with the power provided through the ignition switch energizing a separate solenoid (White-Rogers 123-105-211 or Prestolite 28308). The solenoid on all twenty-four (24)-passenger buses shall be located under the hood. A ground cable shall be installed from the lift frame to the vehicle frame of the bus.

Reason for the change: The Ricon S Series lifts have been tested and are equal to the Braun Millennium lifts. The current vendor is already providing training services. The new vendor should be on the same terms. The Prestolite 28308 solenoid is equal to the White-Rogers 123-105-211 solenoid.

39. Page 100 **ELECTRONIC VEHICLE INSPECTION SYSTEM**, Add:

Zonar electronic vehicle inspection systems, or prior approved equal may be installed as a local district purchase option.

Reason for the change: This system is designed allow local districts to better monitor pre-trip inspections and deliver the results of these inspections more quickly.

40. Page 104, **SUPPLEMENTAL HEATING SYSTEMS**, Add:

Supplemental Heating Systems

A supplemental heating system may be installed as a local district purchase option provided it is O.E.M. installed (at the factory) and is designed to work in concert with the existing coolant based heating system.

The body company shall certify that these systems meet FMVSS 301 fuel system standard at the time they leave the factory.

Reason for change: In certain rare circumstances a district may need to have quicker heat recovery times than is possible with the conventional heating systems provided. An example would be special needs bus that makes frequent stops and uses the lift at each stop. This option allows local district to use supplemental heating systems when needed.